

# Virology

Volume 166

1988

## EDITORS

W. K. Joklik, EDITOR-IN-CHIEF    A. Berk    R. Haselkorn    M. M.-C. Lai    F. Rapp  
J. K. Rose    J. G. Shaw    M. D. Summers    P. K. Vogt

## ASSOCIATE EDITORS

<i>P. Ahlquist</i>	<i>D. L. Court</i>	<i>T. Grodzicker</i>	<i>D. M. Livingston</i>	<i>D. J. Pickup</i>	<i>G. E. Smith</i>
<i>G. Air</i>	<i>R. J. Courtney</i>	<i>M. Hayman</i>	<i>R. B. Luftig</i>	<i>P. M. Pitha-Rowe</i>	<i>V. Stollar</i>
<i>C. Baglioni</i>	<i>S. Dales</i>	<i>P. Hearing</i>	<i>W. Mason</i>	<i>R. H. Purcell</i>	<i>J. H. Strauss</i>
<i>A. K. Banerjee</i>	<i>W. G. Dougherty</i>	<i>K. V. Holmes</i>	<i>G. McFadden</i>	<i>V. Racaniello</i>	<i>B. Sugden</i>
<i>C. Basilio</i>	<i>E. Ehrenfeld</i>	<i>M. S. Horwitz</i>	<i>J. E. Mertz</i>	<i>H. R. Revel</i>	<i>D. F. Summers</i>
<i>K. L. Beemon</i>	<i>R. N. Eisenman</i>	<i>M. M. Howe</i>	<i>L. K. Miller</i>	<i>H. D. Robertson</i>	<i>M. M. Susskind</i>
<i>T. Ben-Porat</i>	<i>M. K. Estes</i>	<i>R. Hull</i>	<i>P. Model</i>	<i>H. L. Robinson</i>	<i>R. I. Swanstrom</i>
<i>K. I. Berns</i>	<i>M. Feiss</i>	<i>E. Hunter</i>	<i>T. J. Morris</i>	<i>W. S. Robinson</i>	<i>R. H. Symons</i>
<i>J. M. Bishop</i>	<i>B. N. Fields</i>	<i>T. Hunter</i>	<i>B. Moss</i>	<i>G. F. Rohrmann</i>	<i>P. Tattersall</i>
<i>H. R. Bose, Jr.</i>	<i>S. J. Flint</i>	<i>A. O. Jackson</i>	<i>S. A. Moyer</i>	<i>B. Roizman</i>	<i>M. J. Tevethia</i>
<i>T. R. Broker</i>	<i>W. R. Folk</i>	<i>J. E. Johnson</i>	<i>F. A. Murphy</i>	<i>J. A. Rose</i>	<i>D. A. Thorley-Lawson</i>
<i>G. E. Bruening</i>	<i>R. I. B. Francki</i>	<i>J. D. Keene</i>	<i>J. R. Nevins</i>	<i>L. B. Rothman-Denes</i>	<i>C. P. Van Beveren</i>
<i>M. J. Buchmeier</i>	<i>D. A. Galloway</i>	<i>E. Kieff</i>	<i>D. J. O'Callaghan</i>	<i>C. E. Samuel</i>	<i>I. M. Verma</i>
<i>E. Carstens</i>	<i>E. P. Geiduschek</i>	<i>D. F. Klessig</i>	<i>P. Palese</i>	<i>P. A. Schaffer</i>	<i>L. E. Volkman</i>
<i>B. J. Carter</i>	<i>C. Georgopoulos</i>	<i>E. Knight, Jr.</i>	<i>P. Palukaitis</i>	<i>B. S. Schaffhausen</i>	<i>E. K. Wagner</i>
<i>J. M. Coffin</i>	<i>W. Gerhard</i>	<i>D. M. Knipe</i>	<i>E. Paoletti</i>	<i>M. J. Schlesinger</i>	<i>F. Wong-Staal</i>
<i>C. N. Cole</i>	<i>R. M. Goodman</i>	<i>M. Lai</i>	<i>J. T. Parsons</i>	<i>P. B. Sehgal</i>	<i>J. S. Youngner</i>
<i>R. C. Condit</i>	<i>A. Granoff</i>	<i>R. A. Lamb</i>	<i>M. E. Peebles</i>	<i>C. J. Sherr</i>	<i>N. D. Zinder</i>
<i>J. A. Cooper</i>	<i>D. E. Griffin</i>	<i>L. Levintow</i>			



ACADEMIC PRESS, INC.

Harcourt Brace Jovanovich, Publishers

San Diego New York Boston

London Sydney Tokyo Toronto

Copyright © 1988 by Academic Press, Inc.

All Rights Reserved

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the copyright owner.

The appearance of the code at the bottom of the first page of an article in this journal indicates the copyright owner's consent that copies of the article may be made for personal or internal use, or for the personal or internal use of specific clients. This consent is given on the condition, however, that the copier pay the stated per copy fee through the Copyright Clearance Center, Inc. (27 Congress Street, Salem, Massachusetts 01970), for copying beyond that permitted by Sections 107 or 108 of the U. S. Copyright Law. This consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale. Copy fees for pre-1988 articles are as shown on the article title pages; if no fee code appears on the title page, the copy fee is the same as for current articles.

0042-6822/88 \$3.00

MADE IN THE UNITED STATES OF AMERICA



# Contents of Volume 166

Number 1, September 1988

<b>Sindbis Virus Infection Decreases Intracellular pH: Alkaline Medium Inhibits Processing of Sindbis Virus Polypeptides</b>	Linda L. Moore, Denise A. Bostick, and Robert F. Garry .....	1
<b>A Carboxyl-Terminal Peptide of the DNA-Binding Protein ICP8 of Herpes Simplex Virus Contains a Single-Stranded DNA-Binding Site</b>	Susan S. Leinbach and Louise S. Heath .....	10
<b>Semliki Forest Virus Particles Containing Only the E<sub>1</sub> Envelope Glycoprotein Are Infectious and Can Induce Cell-Cell Fusion</b>	Adames Omar and Hans Koblet .....	17
<b>Interferons as Gene Activators: Close Linkage of Two Interferon-Activatable Murine Genes</b>	Daniel A. Engel, Jay Snoddy, Elena Toniato, and Peter Lengyel .....	24
<b>Molecular Cloning and Characterization of the DNA of Two Papillomaviruses from Monkeys</b>	Bruce E. Kloster, Dawn A. Manias, Ronald S. Ostrow, M. Kathleen Shaver, Scott W. McPherson, S. R. S. Rangen, Hideo Uno, and Anthony J. Faras .....	30
<b>Factor(s) Present in Herpes Simplex Virus Type 1-Infected Cells Can Compensate for the Loss of the Large Subunit of the Viral Ribonucleotide Reductase: Characterization of an ICP6 Deletion Mutant</b>	David J. Goldstein and Sandra K. Weller .....	41
<b>Capsid Protein VP1 (p85) of Aleutian Disease Virus Is a Major DNA-Binding Protein</b>	Kurt Willwand and Oskar-Rüger Kaaden .....	52
<b>Leukemogenicity of Moloney Murine Leukemia Viruses Carrying Polyoma Enhancer Sequences in the Long Terminal Repeat Is Dependent on the Nature of the Inserted Polyoma Sequences</b>	Hung Fan, Hilary Chute, Euphemia Chao, and Paul K. Pattengale .....	58
<b>Synthesis of Virus-Specific RNA in Permeabilized Murine Coronavirus-Infected Cells</b>	Julian L. Leibowitz and James R. DeVries .....	66
<b>A Block to the Intracellular Transport and Assembly of Hepatitis B Surface Antigen Polypeptides in <i>Xenopus</i> Oocytes</b>	Kay Simon, V. R. Lingappa, and Don Ganem ....	76
<b>Antibody-Mediated Activation of Sindbis Virus</b>	Daniel C. Flynn, Robert A. Olmsted, John M. Mackenzie, Jr., and Robert E. Johnston ....	82
<b><i>In Vitro</i> Assembly of the Outer Shell of Bacteriophage <math>\phi</math>6 Nucleocapsid</b>	Nicholas T. Ktistakis, Chia-Yi Kao, and Dimitrij Lang .....	91
<b>Interrupted Replication of Hepatitis B Virus in Liver Tissue of HBsAg Carriers with Hepatocellular Carcinoma</b>	Giovanni Raimondo, Robert D. Burk, Harvey M. Lieberman, Joseph Muschel, Stephanos J. Hadziyannis, Hans Will, Michael C. Kew, Geoffrey M. Dusheiko, and David A. Shafritz	103
<b>Dissociation of Carcinogen-Induced SV40 DNA-Amplification and Amplification of AAV DNA in a Chinese Hamster Cell Line</b>	Ursula Bantel-Schaal and Harald zur Hausen ...	113



<b>Association of Soluble Matrix Protein of Newcastle Disease Virus with Liposomes Is Independent of Ionic Conditions</b>	Kay S. Faaberg and Mark E. Peeples .....	123
<b>Host Cell-Dependent Homologous Interference in Lymphocytic Choriomeningitis Virus Infection</b>	Michael Bruns, André Gessner, Heinz Lothar, and Fritz Lehmann-Grube .....	133
<b>Molecular Cloning and Mapping of Rat Cytomegalovirus DNA</b>	William H. Burns, Gene M. Barbour, and Gordon R. Sandford .....	140
<b>Cloning of the Fusion Gene of Rinderpest Virus: Comparative Sequence Analysis with Other Morbilliviruses</b>	David Hsu, Miles Yamanaka, Judy Miller, Beverly Dale, Marvin Grubman, and Tilahun Yilma ..	149
<b>Expression and Rescue of a Nonselected Marker from an Integrated AAV Vector</b>	Ella Mendelson, Mervyn G. Smith, and Barrie J. Carter .....	154
<b>Reactivation of the Methylation-Inhibited Late E2A Promoter of Adenovirus Type 2 by a Strong Enhancer of Human Cytomegalovirus</b>	Dagmar Knebel-Mörsdorf, Sabine Achten, Klaus-Dieter Langner, Rüdiger Rüger, Bernhard Fleckenstein, and Walter Doerfler .....	166
<b>The Late Promoter of the Human Papovavirus BK Is Contained within the Early Promoter Enhancer Region</b>	J. Aaron Cassill and Suresh Subramani .....	175
<b>Mutational Dissection of the HSV-1 Immediate-Early Protein Vmw175 Involved in Transcriptional Transactivation and Repression</b>	T. Paterson and R. D. Everett .....	186
<b>Sequence of the Structural Proteins of Tick-Borne Encephalitis Virus (Western Subtype) and Comparative Analysis with Other Flaviviruses</b>	Christian W. Mandl, Franz X. Heinz, and Christian Kunz .....	197
<b>Characterization of a Major Virion Envelope Glycoprotein Complex of Murine Cytomegalovirus and Its Immunological Cross-Reactivity with Human Cytomegalovirus</b>	Lambert C. Loh, N. Balachandran, and Louis F. Qualtiere .....	206
<b>Selective Induction of Chromosomal Gene Expression by Human Cytomegalovirus</b>	Anamaris M. Colberg-Poley and Linda D. Santomenna .....	217
<b>Tumorigenic Poxviruses: Fine Analysis of the Recombination Junctions in Malignant Rabbit Fibroma Virus, a Recombinant between Shope Fibroma Virus and Myxoma Virus</b>	C. Upton, J. L. Macen, R. A. Maranchuk, A. M. DeLange, and G. McFadden .....	229

#### Short Communications

<b><i>In Vivo</i> Isolation of Baculovirus Genotypes</b>	Ian R. L. Smith and Norman E. Crook .....	240
<b>Synthetic Oligopeptides Define Epitopes at the Amino- and Carboxy-Terminus of Simian Virus 40 Large Tumor Antigen Which Are Recognized by Monoclonal Antibodies</b>	Angelika Schoeffel, Sabine Weist, Roland K. Ball, Karl-Heinz Scheidtmann, Dietmar G. Braun, and Gerhard Brandner .....	245
<b>The Capacity of Avian Retrovirus-Induced Sarcomas to Expand by Infectious Virus Production</b>	Michael S. Halpern, Kenneth Falkowitz, Francisco Branco, and James M. England .....	248
<b>Cloning and Sequence Analysis of the Hemagglutinin Gene of the Virulent Strain of Rinderpest Virus</b>	Miles Yamanaka, David Hsu, Tracy Crisp, Beverly Dale, Marvin Grubman, and Tilahun Yilma ..	251



<b>A Herpes Simplex Virus Transcript Abundant in Latently Infected Neurons Is Dispensable for Establishment of the Latent State</b>	Ronald T. Javier, Jack G. Stevens, Vivian B. Dissette, and Edward K. Wagner .....	254
<b>The Herpes Simplex Virus Type 1 Immediate-Early Protein ICP4 Specifically Induces Increased Transcription of the Human Ubiquitin B Gene without Affecting the Ubiquitin A and C Genes</b>	L. M. Kemp and D. S. Latchman .....	258
<b>Herpes Simplex Virus-Induced dUTPase: Target Site for Antiviral Chemotherapy</b>	Marshall V. Williams .....	262
<b>Protein 3CD Is the Major Poliovirus Proteinase Responsible for Cleavage of the P1 Capsid Precursor</b>	Mary Frances Ypma-Wong, Patricia Gillis Dewalt, Victoria H. Johnson, John G. Lamb, and Bert L. Semler .....	265
<b>Sequence Analysis of the Hemagglutinin of B/Ann Arbor/1/86, an Epidemiologically Significant Variant of Influenza B Virus</b>	Janet S. Bootman and James S. Robertson .....	271
<b>Rift Valley Fever Virus M Segment: Cellular Localization of M Segment-Encoded Proteins</b>	Terri L. Wasmoen, Laura Torborg Kakach, and Marc S. Collett .....	275
<b>Adenovirus Type 5 and Adenovirus Type 12 Recombinant Viruses Containing Heterologous E1 Genes Are Viable, Transform Rat Cells, but Are Not Tumorigenic in Rats</b>	Yukiharu Sawada, Karel Raška, Jr., and Thomas Shenk .....	281
<b>Resistance of the 64K Protein of Budded <i>Autographa californica</i> Nuclear Polyhedrosis Virus to Functional Inactivation by Proteolysis</b>	Loy E. Volkman and Phyllis A. Goldsmith .....	285
<b>Erratum</b>		
<b>Volume 164, Number 2, June 1988: Kyoko Tsukiyama, Yasuhiro Yoshikawa, and Kazuya Yamanouchi, "Fusion Glycoprotein (F) of Rinderpest Virus: Entire Nucleotide Sequence of the F mRNA, and Several Features of the F Protein," pp. 523-530 .....</b>		290
<b>Author Index for Volume 166, Number 1 .....</b>		291

## Number 2, October 1988

<b>Canine Host Range and a Specific Epitope Map along with Variant Sequences in the Capsid Protein Gene of Canine Parvovirus and Related Feline, Mink, and Raccoon Parvoviruses</b>	Colin R. Parrish, Charles F. Aquadro, and Leland E. Carmichael .....	293
<b>Nucleotide Sequence of UK Bovine Rotavirus Segment 4: Possible Host Restriction of VP3 Genes</b>	Phillip Kantharidis, Michael L. Dyall-Smith, G. W. Tregear, and Ian H. Holmes .....	308
<b>Sequence and Symmetry Requirements within the Internal Palindromic Sequences of the Adeno-Associated Virus Terminal Repeat</b>	Roy A. Bohenzky, Rance B. LeFebvre, and Kenneth I. Berns .....	316
<b>Regional Localization of Virus in the Central Nervous System of Mice Persistently Infected with Murine Coronavirus JHM</b>	Stanley Perlman, Gary Jacobsen, and Steven Moore .....	328
<b>Characterization of Human Immunodeficiency Virus <i>gag/pol</i> Gene Products Expressed by Recombinant Vaccinia Viruses</b>	Charles Flexner, Steven S. Broyles, Patricia Earl, Sekhar Chakrabarti, and Bernard Moss .....	339



<b>The Functional Domains of the Phosphoprotein (NS) of Vesicular Stomatitis Virus (Indiana Serotype)</b>	Palash R. Paul, Dhrubajyoti Chattopadhyay, and Amiya K. Banerjee .....	350
<b>Structure and Protein Composition of the Rotavirus Replisome Particle</b>	John T. Patton and Claudia O. Gallegos .....	358
<b>UL5, A Protein Required for HSV DNA Synthesis: Genetic Analysis, Overexpression in <i>Escherichia coli</i>, and Generation of Polyclonal Antibodies</b>	Liang Zhu and Sandra K. Weller .....	366
<b>Stress-Induced Increase of Hexose Transport as a Novel Index of Cytopathic Effects in Virus-Infected Cells: Role of the L Protein in the Action of Vesicular Stomatitis Virus</b>	C. A. Pasternak, P. A. Whitaker-Dowling, and C. C. Widnell .....	379
<b>Antigenic Analysis of the Epstein-Barr Virus Major Membrane Antigen (gp350/220) Expressed in Yeast and Mammalian Cells: Implications for the Development of a Subunit Vaccine</b>	Emilio A. Emini, William A. Schleif, Marcy E. Armstrong, Melvin Silberklang, Loren D. Schultz, Dale Lehman, Robert Z. Maigetter, Louis F. Qualtiere, Gary R. Pearson, and Ronald W. Ellis .....	387
<b>Point Mutations Modify the Response of Poliovirus RNA to a Translation Initiation Factor: A Comparison of Neurovirulent and Attenuated Strains</b>	Yuri V. Svitkin, Tatyana V. Pestova, Svetlana V. Maslova, and Vadim I. Agol .....	394
<b>Proteolytic Processing of Poliovirus Polyprotein: Elimination of 2A<sup>pro</sup>-Mediated, Alternative Cleavage of Polypeptide 3CD by <i>in Vitro</i> Mutagenesis</b>	Chong-Kyo Lee and Eckard Wimmer .....	405
<b>Sequence of Mouse Hepatitis Virus A59 mRNA 2: Indications for RNA Recombination between Coronaviruses and Influenza C Virus</b>	Willem Luytjes, Peter J. Bredenbeek, Ans F. H. Noten, Marian C. Horzinek, and Willy J. M. Spaan .....	415
<b>Antibody-Resistant Mutations in Cross-Reactive and Type-Specific Epitopes of Herpes Simplex Virus 1 Glycoprotein B Map in Separate Domains</b>	Konstantin G. Kousoulas, Bin Huo, and Lenore Pereira .....	423
<b>Packaging and Transduction of Non-T3 DNA by Bacteriophage T3</b>	Chikara Hashimoto and Hisao Fujisawa .....	432
<b>Inhibition of Terminal N- and O-Glycosylation Specific for Herpesvirus-Infected Cells: Mechanism of an Inhibitor of Sugar Nucleotide Transport across Golgi Membranes</b>	Sigvard Olofsson, Marcos Milla, Carlos Hirschberg, Erik De Clercq, and Roelf Datema ....	440
<b>Analysis of the <i>in Vitro</i> Translation Products of the Equine Herpesvirus Type 1 Immediate Early mRNA</b>	Alice T. Robertson, Gretchen B. Caughman, Wayne L. Gray, Raymond P. Baumann, John Staczek, and Dennis J. O'Callaghan .....	451
<b>Theiler's Virus-Associated Antigens on the Surfaces of Cultured Glial Cells</b>	Moses Rodriguez, Lance M. Siegel, Debra Hovanec-Burns, Liane Bologa, and Michael C. Graves .....	463
<b>The Duck Hepatitis B Virus P-Gene Codes for Protein Strongly Associated with the 5'-End of the Viral DNA Minus Strand</b>	Valerie Bosch, Ralf Bartenschlager, Gerald Radziwill, and Heinz Schaller .....	475



<b>Analysis of Lettuce Necrotic Yellows Virus Structural Proteins with Monoclonal Antibodies and Concanavalin A</b>	Ralf G. Dietzgen and R. I. B. Francki .....	486
<b>Characterization of Cucumber Mosaic Virus. I. Molecular Heterogeneity Mapping of RNA 3 in Eight CMV Strains</b>	Judith Owen and Peter Palukaitis .....	495
<b>Prediction of Three-Dimensional Models for Foot-and-Mouth Disease Virus and Hepatitis A Virus</b>	Ming Luo, Michael G. Rossmann, and Ann C. Palmenberg .....	503
<b>Regulation of Host RNA Levels during Baculovirus Infection</b>	Beng Guat Ooi and Lois K. Miller .....	515
<b>Resistance to TMV in Transgenic Plants Results from Interference with an Early Event in Infection</b>	James C. Register III and Roger N. Beachy .....	524
<b>The Role of Bone Marrow and Thymic Elements in the Initiation and Spread of Virus Production in the AKR Thymus</b>	Robert W. Buckheit, Jr., Dani P. Bolognesi, and Kent J. Weinhold .....	533
<b>Sequence of a Bovine Herpesvirus Type-1 Glycoprotein Gene That Is Homologous to the Herpes Simplex Gene for the Glycoprotein gB</b>	Vikram Misra, Randy Nelson, and Michael Smith .....	542
<b>Primary Structure and Translation of a Defective Interfering RNA of Murine Coronavirus</b>	Shinji Makino, Chien-Kou Shieh, Lisa H. Soe, Susan C. Baker, and Michael M. C. Lai .....	550
<b>A Host-Dependent Temperature-Sensitive Mutant of Rous Sarcoma Virus: Evidence for Host Factors Affecting Transformation</b>	Judy C. Young, Eric Liebl, and G. Steven Martin .....	561
<b>Mechanism of Interferon Action. Expression of Reovirus S3 Gene in Transfected COS Cells and Subsequent Inhibition at the Level of Protein Synthesis by Type I but Not by Type II Interferon</b>	Cyril X. George and Charles E. Samuel .....	573

#### Short Communications

<b>Characterization of the Phage-Specific Transfer RNA Molecules Coded by Cholera Phage <math>\phi</math>149</b>	Nripendranath Mandal and Ranajit Kumar Ghosh .....	583
<b>Characterization of a Latent Protein Encoded by the Large Internal Repeats and the <i>Bam</i>HI Y Fragment of the Epstein-Barr Virus (EBV) Genome</b>	Marlies Sauter, Harald Boos, Friedrich Hirsch, and Nikolaus Mueller-Lantzsch .....	586
<b>Breaking and Rejoining of Disulfide Bonds in External Glycoproteins of Influenza Virus</b>	L. M. Selimova, A. A. Tashenova, and V. M. Zaides .....	591
<b>Functional Dissociation of Transforming Genes of Human Papillomavirus Type 16</b>	Masuo Yutsudo, Yuji Okamoto, and Akira Hakura .....	594
<b>Herpes Simplex Virus Glycoprotein D Is Sufficient to Induce Spontaneous pH-Independent Fusion in a Cell Line that Constitutively Expresses the Glycoprotein</b>	Gabriella Campadelli-Fiume, Elisa Avitabile, Sergio Fini, Daniela Stirpe, Minas Arsenakis, and Bernard Roizman .....	598
<b>Comparison of the Nucleotide Sequences of Diabetogenic and Nondiabetogenic Encephalomyocarditis Virus</b>	Stuart H. Cohen, Robert K. Naviaux, Kurt M. Vanden Brink, and George W. Jordan .....	603
<b>Site-Directed Cytotoxic Antibody Against the C-Terminal Segment of the Surface Glycoprotein gp90 of Avian Reticuloendotheliosis Virus</b>	Wen-Po Tsai and Stephen Oroszlan .....	608

<b>Effect of a Viral <i>rep</i> Gene on Transformation of Cells by an Adeno-Associated Virus Vector</b>	Ella Mendelson, Mervyn G. Smith, Irving L. Miller, and Barrie J. Carter .....	612
<b>A Polyomavirus Tumor-Specific Transplantation Antigen (TSTA) Epitope Is Situated within the N-Terminal Amino Acid Sequence Common to Middle and Small T-Antigens</b>	Git Reinholdsson, Torbjörn Ramqvist, John Brandberg, and Tina Dalianis .....	616
<b>Characterization of a Unique Protein Produced by Influenza A Virus Recovered from a Long-Term Persistent Infection</b>	William T. Lucas, Patricia Whitaker-Dowling, Christopher R. Kaifer, and Julius S. Youngner .....	620
<b>Identification of HPV 16 Early Genes Retained in Cervical Carcinomas</b>	S. P. Wilczynski, L. Pearlman, and J. Walker ....	624
<b>Author Index for Volume 166</b> .....		628
<b>Subject Index for Volume 166</b> .....		630